



## Maryland Department of Health and Mental Hygiene Virtual Data Unit Report (September 2012)

# Data Use Notice: Methodological Changes in the 2011 Maryland Behavioral Risk Factor Surveillance System

## Behavioral Risk Factor Surveillance System (BRFSS)

The Maryland Behavioral Risk Factor Surveillance System (BRFSS), is a statewide telephone survey that tracks prevalence and trends over time for many health variables. All states, the District of Columbia, and three territories collect BRFSS data. Maryland annually collects approximately 12,000 interviews and includes a Spanish version and an asthma call-back survey. BRFSS is one of the main sources of health data for policymakers and health programs in Maryland and is available through a public, online database: <http://www.marylandbrfss.org>.

## BRFSS Methodology Changes

**Sampling:** A subset of the population is surveyed to estimate characteristics of the entire population. Previous to 2011, BRFSS only surveyed households with a landline telephone. CDC determined that cellular phone-only households should be included in the survey to account for the increasing proportion of cellular phone-only households.

**Weighting:** When the data collected from survey respondents are adjusted to more accurately represent the Maryland population, the resulting data are called weighted data. Weighted data makes the sample more representative of the total population and reduces sampling bias. As displayed in Table 1, BRFSS data previous to 2011 was weighted on age, race, and gender using a technique called poststratification. Beginning with 2011 data, BRFSS is weighted on age, race, gender, education, home ownership, marital status, and phone source (landline and cellular) using a technique called raking. For in-depth information from CDC go to: <http://www.cdc.gov/surveillancepractice/reports/brfss/brfss.html>.

**Table 1: BRFSS Weighting Methodology**

| Data Years | Technique          | Weighted by:                                                                           |
|------------|--------------------|----------------------------------------------------------------------------------------|
| ≤ 2010     | Poststratification | Age<br>Race<br>Gender                                                                  |
| ≥ 2011     | Raking             | Age<br>Race<br>Gender<br>Home Ownership<br>Education<br>Marital Status<br>Phone Source |

All states, the District of Columbia, and three territories that collect BRFSS data have made these weighting changes. Since all states are equally affected by the change, state rankings of health variables will continue to be accurate and comparable.

**How does all of this affect BRFSS users?** The new weighting methodology has included more demographic variables to the Maryland BRFSS and has made the sample estimates more representative of the state's population.

**IMPORTANT: 2011 BRFSS data should not be compared or aggregated to previous years of data, since the rates for the previous years are based on the old methodology.** The 2011 and 2012 data can be combined and compared once the 2012 BRFSS data is available next year. Until then, BRFSS users will need to use the 2011 data alone or use data previous to 2011 to examine data time trends and aggregate multiple years of data.

## Comparison of Old and New Methodology for 2011 Data

An analysis was conducted to compare the old weighting methodology with the new weighting methodology for the Maryland 2011 BRFSS data (Table 2). Only a small portion of the variables showed a statistically significant change.

As expected many of these significant differences occurred with demographic variables, most likely a result of the inclusion of the new weighting elements and cell phone-only household interviews.

For the demographic variables, the new methodology significantly decreased the percent of 64 to 74 year old adults, White Non-Hispanics, college graduates, married individuals, households with an income over \$75,000, and home owners in the sample; and increased the percent of Black Non-Hispanics, Hispanics, individuals with less than a high school education, unmarried individuals, households with an income less than \$15,000 and \$15-\$24,999, the unemployed, and home renters in the sample.

For health variables, the new methodology reveals significantly fewer individuals with health insurance coverage, more individuals who could not afford to see a doctor in the past year, more current smokers, and more individuals who had been tested for HIV in their lifetime.

Table 3 (next page) compares the 2010 old weighting methodology prevalence to the 2011 new weighting methodology prevalence on a selection of BRFSS variables to allow an assessment of how these rates have changed due to the new weighting methodology. The comparison demonstrates the difference in disease and risk factor prevalence between the old and new methodologies; however, it cannot be determined if the difference is due to the methodology change or a change in the

| BRFSS Variable                                            | Direction of Change from Old to New Methodology |
|-----------------------------------------------------------|-------------------------------------------------|
| <b>Age Grouped in Ten-Year Categories</b>                 |                                                 |
| 18 – 24                                                   | --                                              |
| 25 – 34                                                   | --                                              |
| 35 – 44                                                   | --                                              |
| 45 – 54                                                   | --                                              |
| 55 – 64                                                   | --                                              |
| 65 – 74                                                   | Decrease                                        |
| 75+                                                       | --                                              |
| <b>Race</b>                                               |                                                 |
| White, Non-Hispanic                                       | Decrease                                        |
| Black, Non-Hispanic                                       | Increase                                        |
| Other Race Only, Non-Hispanic                             | --                                              |
| Multi-Race, Non-Hispanic                                  | --                                              |
| Hispanic                                                  | Increase                                        |
| <b>Education</b>                                          |                                                 |
| Less than High School                                     | Increase                                        |
| High School Graduate or GED                               | --                                              |
| Some College or Tech School                               | --                                              |
| College Graduate                                          | Decrease                                        |
| <b>Marital Status</b>                                     |                                                 |
| Married                                                   | Decrease                                        |
| Unmarried                                                 | Increase                                        |
| <b>Household Income</b>                                   |                                                 |
| Less than \$15,000                                        | Increase                                        |
| \$15-24,999                                               | Increase                                        |
| \$25-49,999                                               | --                                              |
| \$50-74,999                                               | --                                              |
| Greater than \$75,000                                     | Decrease                                        |
| <b>Employment Status</b>                                  |                                                 |
| Employed                                                  | --                                              |
| Not Employed                                              | Increase                                        |
| Student/Homemaker                                         | --                                              |
| Retired/Unable to Work                                    | --                                              |
| <b>Home Ownership Status</b>                              |                                                 |
| Own                                                       | Decrease                                        |
| Rent                                                      | Increase                                        |
| Other Arrangement                                         | --                                              |
| <b>Have Health Insurance Coverage?</b>                    |                                                 |
| Yes                                                       | Decrease                                        |
| No                                                        | Increase                                        |
| <b>Could Not Afford to See a Doctor in the Past Year?</b> |                                                 |
| Yes                                                       | Increase                                        |
| No                                                        | Decrease                                        |
| <b>Current Smoker?</b>                                    |                                                 |
| Yes                                                       | Increase                                        |
| No                                                        | Decrease                                        |
| <b>Have You Ever Been Tested for HIV?</b>                 |                                                 |
| Yes                                                       | Increase                                        |
| No                                                        | Decrease                                        |

<sup>a</sup>Variable categories that had no significant differences are displayed as --.

## Comparison of 2010 and 2011 Data

**Table 3: Maryland BRFSS 2010 and 2011 Prevalence Comparison<sup>a</sup>**

| BRFSS Variable                                                            | OLD WEIGHT <sup>b</sup> - 2010 |                |                |                 | NEW WEIGHT <sup>c</sup> - 2011 |      |         |             | % Difference <sup>e</sup><br>(2011-2010) |
|---------------------------------------------------------------------------|--------------------------------|----------------|----------------|-----------------|--------------------------------|------|---------|-------------|------------------------------------------|
|                                                                           | %                              | n <sup>d</sup> | N <sup>e</sup> | CI <sup>f</sup> | %                              | n    | N       | CI          |                                          |
| <b>Current Smoking</b>                                                    | 15.2                           | 1281           | 655586         | 14.3 - 16.1     | 19.1                           | 1477 | 840489  | 18.2 - 20.0 | 3.90                                     |
| <b>General Health</b>                                                     |                                |                |                |                 |                                |      |         |             |                                          |
| Excellent                                                                 | 22.5                           | 1879           | 973436         | 21.5 - 23.6     | 21.9                           | 2055 | 965965  | 20.9 - 22.9 | -0.60                                    |
| Very Good                                                                 | 34.3                           | 3131           | 1477494        | 33.1 - 35.5     | 33.9                           | 3479 | 1494781 | 32.8 - 35.0 | -0.40                                    |
| Good                                                                      | 30.1                           | 2677           | 1298678        | 29.0 - 31.3     | 30.1                           | 3020 | 1328128 | 29.0 - 31.2 | 0.00                                     |
| Fair                                                                      | 10.0                           | 1089           | 431177         | 9.3 - 10.8      | 11.1                           | 1151 | 490655  | 10.4 - 11.9 | 1.10                                     |
| Poor                                                                      | 3.0                            | 388            | 130251         | 2.6 - 3.4       | 3.1                            | 385  | 135835  | 2.7 - 3.5   | 0.10                                     |
| <b>Poor Health</b>                                                        |                                |                |                |                 |                                |      |         |             |                                          |
| None                                                                      | 80.8                           | 7259           | 3429423        | 79.8 - 81.8     | 79.5                           | 8014 | 3472399 | 78.5 - 80.5 | -1.30                                    |
| 1-2 days                                                                  | 7.2                            | 534            | 304548         | 6.6 - 7.9       | 6.0                            | 575  | 262744  | 5.4 - 6.6   | -1.20                                    |
| 3-7 days                                                                  | 4.9                            | 460            | 207986         | 4.4 - 5.5       | 5.7                            | 528  | 246705  | 5.1 - 6.3   | 0.80                                     |
| 8-29 days                                                                 | 4.4                            | 446            | 184739         | 3.9 - 4.9       | 5.4                            | 501  | 236671  | 4.9 - 5.9   | 1.00                                     |
| 30 days                                                                   | 2.8                            | 307            | 119160         | 2.4 - 3.2       | 3.4                            | 354  | 147766  | 3.0 - 3.8   | 0.60                                     |
| <b>Adult Asthma</b>                                                       | 12.4                           | 1120           | 535356         | 11.6 - 13.2     | 13.8                           | 1174 | 610259  | 13.0 - 15.0 | 1.40                                     |
| <b>Child Asthma</b>                                                       | 16.4                           | 362            | 216002         | 14.6 - 18.2     | 12.6                           | 352  | 168878  | 11.0 - 12.2 | -3.80                                    |
| <b>Health Coverage</b>                                                    | 10.9                           | 667            | 467854         | 10.1 - 11.7     | 13.0                           | 777  | 573191  | 12.2 - 13.8 | 2.10                                     |
| <b>Had a Flu Shot Past Yr-Adults</b>                                      | 43.0                           | 4485           | 1812946        | 41.8 - 44.3     | 41.0                           | 4568 | 1704015 | 39.8 - 42.2 | -2.00                                    |
| <b>Ever Had a Heart Attack</b>                                            | 3.7                            | 485            | 157342         | 3.2 - 4.2       | 4.2                            | 518  | 183027  | 3.7 - 4.7   | 0.50                                     |
| <b>Ever Had a Stroke</b>                                                  | 2.5                            | 335            | 107661         | 2.1 - 2.9       | 2.6                            | 357  | 114517  | 2.2 - 3.0   | 0.10                                     |
| <b>Had a Pneumonia Shot-Adults</b>                                        | 27.4                           | 2822           | 1046964        | 26.2 - 28.6     | 30.4                           | 3207 | 1124329 | 29.2 - 31.6 | 3.00                                     |
| <b>Had a Flu Shot Past Yr-Children</b>                                    | 53.7                           | 1195           | 670689         | 41.8 - 44.3     | 57.6                           | 1311 | 728040  | 40.0 - 44.8 | 3.90                                     |
| <b>Last 12 Month Could Not Afford Health Coverage</b>                     | 12.0                           | 830            | 518508         | 11.2 - 12.8     | 13.1                           | 935  | 578569  | 12.3 - 13.9 | 1.10                                     |
| <b>Told You Have Diabetes?</b>                                            | 9.4                            | 1123           | 400679         | 8.7 - 10.1      | 9.6                            | 1213 | 417895  | 8.9 - 10.3  | 0.20                                     |
| <b>Binge Drinking</b>                                                     | 14.6                           | 944            | 609610         | 13.7 - 15.5     | 18.0                           | 1163 | 732152  | 17.1 - 19.0 | 3.40                                     |
| <b>Chronic Drinking</b>                                                   | 4.5                            | 388            | 187166         | 4.0 - 5.0       | 6.2                            | 501  | 252498  | 5.6 - 6.8   | 1.70                                     |
| <b>Activities Limited Due to Physical, Mental, or Emotional Problems?</b> | 18.4                           | 2118           | 791165         | 17.4 - 19.4     | 21.0                           | 2443 | 880298  | 20.0 - 22.0 | 2.60                                     |

<sup>a</sup>All variables above (besides those with listed categories) are "Yes" responses.

<sup>b</sup>Weight used until 2010: includes age, race, gender, and only landline interviews.

<sup>c</sup>New weight from 2011: includes age, race, gender, home ownership, education, marital status, and landline and cellular phone interviews.

<sup>d</sup>Number of Maryland residents who took the survey.

<sup>e</sup>Weighted estimate for the Maryland Population.

<sup>f</sup>Confidence interval at the 95% probability.

<sup>g</sup>Difference in the prevalence values between 2011 and 2010.

*In conclusion, there are significant demographic changes related to the new methodology for the 2011 BRFSS data. As a result of these changes, 2011 BRFSS data should not be compared or aggregated to previous years of data.*